

## What is Claimed:

- 1                   1.       A method for improving the overall process efficiency of sulfate  
2       sulfite, or alcohol pulping, pulp washing or pulp bleaching comprising the step of:  
  
3                   removing high molecular weight organic by-products from any liquor or  
4       filtrate stream withdrawn from a process step by passing said liquor or filtrate stream  
5       through a filtration media that will trap said high molecular weight organic by-  
6       products.
- 1                   2.       A method according to claim 1 including the step of reusing said  
2       liquor or said filtrate stream in said process.
- 1                   3.       A method according to claim 1 including the step of using  
2       membrane separation to remove said high molecular weight organic by-products.
- 1                   4.       A method for improving the overall efficiency of the digesting  
2       step of a wood fiber pulping process comprising the steps of:  
  
3                   separating at least a portion of liquor from wood pulp at one of, during  
4       or after said digesting step and passing said liquor through a filtration media to remove  
5       high molecular weight organic by-products from said liquor; and  
  
6                   returning said liquor containing a lower concentration of high molecular  
7       weight organic by-products to said digesting step.
- 1                   5.       A method according to claim 4 including the step of using  
2       membrane separation to remove said high molecular weight organic by-products from  
3       said liquor.
- 1                   6.       A method according to claim 4 including the step of recovering  
2       pulp by washing an effluent from said digesting step, separating washing fluid from  
3       said washing step and passing said washing fluid through a filtration media to remove  
4       high molecular weight organic by-products from said washing fluid.

1                   7.     A method according to claim 4 including the step of recycling  
2     said washing fluid to said washing step after said high molecular weight organic by-  
3     products have been removed.

1                   8.     A method for improving the overall efficiency of the digesting  
2     step of a Kraft pulping process comprising the steps of:

3                   separating at least a portion of black liquor from wood pulp at one of  
4     during or after a digesting step and passing said black liquor through a filtration media  
5     to remove high molecular weight organic by-products from said liquor and returning  
6     said black liquor containing a lower concentration of high molecular weight organic by-  
7     products to said digesting step.

1                   9.     A method according to claim 8 including the step of using  
2     membrane separation to remove said high molecular organic by-products from said  
3     liquor.

1                   10.    A method according to claim 8 including the step of recovering  
2     pulp by washing an effluent from said digesting step, separating washing fluid from  
3     said washing step and passing said washing fluid through a filtration media to remove  
4     high molecular weight organic products from said washing fluid.

1                   11.    A method according to claim 10 including the step of recycling  
2     said washing fluid to said washing step after said high molecular weight organic by-  
3     products have been removed.

1                   12.    A method for improving the overall efficiency of sulfite pulping  
2     process comprising the steps of:

3                   separating at least a portion of liquor from wood pulp at one of during or  
4     after a digesting step and passing said liquor through a filtration media to remove high  
5     molecular by-products from said liquor, and returning said liquor containing a lower  
6     concentration of high molecular weight organic by-products to said digesting step.

7                   13.    A method according to claim 12 including the step of using  
8     membrane separation to remove said high molecular by-products from said liquor.

1                   14.     A method according to claim 13 including the step of separating  
2     cooked pulp from said liquor by a washing step.

1                   15.     A method according to claim 14 including the step treating  
2     washing fluid separate from said liquor passing said washing fluid through a filtration  
3     media to remove high molecular weight organic by-products from said washing fluid.

1                   16.     A method according to claim 15 including the step of recycling  
2     said washing fluid to said washing step after said high molecular weight organic by-  
3     products have been removed.

1                   17.     A method for improving the efficiency of a wood pulping process  
2     using a continuous digester comprising the step of incorporating into any digesting  
3     liquor recirculating system a filtration media to remove high molecular weight organic  
4     by-products from said recirculating liquor.

1                   18.     A method for improving the efficiency of a wood pulping process  
2     using a displacement batch digester comprising the step of incorporating into a digester  
3     liquor recirculating system in filtration media to remove high molecular weight organic  
4     by-products from said recirculating liquor.

1                   19.     A method for improving the efficiency of a wood pulping process  
2     incorporating storage of spent liquor comprising the step of: passing one of, said liquor  
3     entering said storage facility, said liquor being withdrawn from said storage facility, or  
4     said liquor both entering and being withdrawn from said storage facility to a filtration  
5     step to remove high molecular weight organic by-products from said liquor.

1                   20.     A method for improving the efficiency of a wood pulping process  
2     incorporating accumulation of spent liquor comprising the step of: passing one of said  
3     liquor entering said accumulation facility, said liquor being withdrawn from said  
4     accumulation facility, or said liquor both entering and being withdrawn from said  
5     accumulation facility, to a filtration step to remove high molecular weight organic by-  
6     products from said liquor.

1                   21.     A method for improving the efficiency of a wood pulping process  
2     incorporating dilution of pulp comprising the step of:

3                    withdrawing a one of liquor or filtrate containing high molecular weight  
4                    organic by-products from any process step;

5                    passing said filtrate through a filter media to remove high molecular  
6                    weight organic by-products to yield a treated filtrate with a lower concentration of  
7                    colloidal and/or high molecular weight organic by-products, and

8                    using said treated liquor or filtrate in any dilution zone, pipe or  
9                    equipment in said pulping process to dilute said pulp.

1                    22.     A method for improving the efficiency of a wood pulping process  
2                    including fiber washing comprising the steps of: separating a washing liquid from said  
3                    washed fibers, passing said washing liquid through a filtration media to remove high  
4                    molecular weight organic by-products from said washing liquid to produce a clean  
5                    washing liquid, and using said clean washing liquid as a washing liquid.

1                    23.     A method for improving the efficiency of a wood pulping process  
2                    that includes oxygen as a delignification stage proceeded by and followed by washing  
3                    of pulp comprising the steps of:

4                    separating washing fluid from said pulp after one of any of the washing  
5                    steps proceeding, or any of the washing steps following said oxygen delignification  
6                    step, passing said separated washing fluid from said pulp through a filtration media to  
7                    remove high molecular weight organic by-products from said washing fluid to produce  
8                    a cleaned washing fluid, and using said cleaned washing fluid in any one of any  
9                    washing operation or to dilute said pulp prior to after or during oxygen delignification.